

## Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.



A65  
M34  
Prelim.

UNITED STATES  
DEPARTMENT OF AGRICULTURE  
LIBRARY



BOOK NUMBER

906624

A65  
M34  
Prelim.

UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Marketing Service  
Washington 25, D. C.

-----  
NOT FOR PUBLICATION  
For discussion purposes only  
Subject to change  
-----

PROPOSED UNITED STATES STANDARDS  
FOR GRADES OF LIQUID SUGAR 1/

The proposed standards are as follows:

PRODUCT DESCRIPTION, TYPES, AND GRADES

§ 52.2711 Product description. Liquid sugar consists of an aqueous solution of sugar derived from sugarcane or sugar beets and contains not less than 66 percent total solids. The product is prepared from clean, sound, refined or partly refined sugar or other sugar product, by solution or by other means which include processes of clarification and decoloration or equivalent purification and is produced in accordance with good commercial practice.

§ 52.2712 Types of liquid sugar. The type of liquid sugar is not incorporated in the grades of the finished product since the type of liquid sugar, as such, is dependent upon the method of preparation and processing and, therefore, is not a factor of quality for the purpose of these grades. Liquid sugar may be prepared and processed as one of the following types:

---

1/ Compliance with these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act. For the purpose of these standards, liquid sugar means "Liquid Sugar" or "Sugar Sirup."



<u>Type</u>	<u>Reducing sugars</u>
Sucrose - - - - -	Not more than 2%
Semi-sucrose - - -	More than 2% but not more than 10%
Low invert - - - -	More than 10% but not more than 30%
Medium invert - - -	More than 30% but not more than 65%
High invert - - - -	More than 65%

§ 52.2713 Grades of liquid sugar. (a) "U. S. Grade A" or "U. S. No. 1" is the quality of liquid sugar that possesses a normal flavor, that is not darker than U.S.D.A. water white color standard; that is clear; that is free from defects; and that scores not less than 90 points when scored in accordance with the scoring system outlined in this subpart.

(b) "U. S. Grade B" or "U. S. No. 2" is the quality of liquid sugar that possesses a normal flavor; that is not darker than U.S.D.A. white color standard; that is practically clear; that is reasonably free from defects; and that scores not less than 80 points when scored in accordance with the scoring system outlined in this subpart.

(c) "U. S. Grade C" or "U. S. No. 3" is the quality of liquid sugar that possesses a normal flavor; that is not darker than U.S.D.A. light amber color standard; that is fairly clear; that is fairly free from defects; and that scores not less than 70 points when scored in accordance with the scoring system outlined in this subpart.

(d) "Substandard" is the quality of liquid sugar that fails to meet the requirements of U. S. Grade C or U. S. No. 3.







## FACTORS OF QUALITY

§ 52.2714 Ascertaining the grade. (a) General. The grade of liquid sugar is ascertained by considering the factors of quality and requirements which are not scored and those which are scored, as follows:

(1) Factors which are not scored.

- (i) Color.
- (ii) Percent total solids.
- (iii) Percent reducing sugars.
- (iv) Flavor.

(2) Factors which are scored. The relative importance of each factor which is scored is expressed numerically on the scale of 100. The maximum number of points that may be given each such factor is:

Factors:	<u>Points</u>
Clarity - - - - -	60
Defects - - - - -	<u>40</u>
Total score - - - - -	100

(3) "Normal flavor" means that the liquid sugar has a good, characteristic normal flavor and odor and is free from fermented, musty flavors and odors or objectionable flavors or objectionable odors of any kind.



§ 52.2715 Ascertaining the rating for the factors which are scored. The essential variations within each factor which is scored are so described that the value may be ascertained for such factors and expressed numerically. The numerical range within each such factor is inclusive (for example, "36 to 40 points" means 36, 37, 38, 39, or 40 points).

§ 52.2716 Clarity. (a) General. The factor of clarity has reference to the degree of freedom from air bubbles, particles of colloidal matter, or from finely divided particles of any kind of suspended material which may affect the clarity of the product.

(b) (A) classification. Liquid sugar that is clear may be given a score of 54 to 60 points. "Clear" means that the liquid sugar is free from particles of suspended material which may affect the clarity, appearance, or edibility of the product.

(c) (B) classification. Liquid sugar that is practically clear may be given a score of 48 to 53 points. Liquid sugar that scores in this classification shall not be graded above U. S. Grade B or U. S. No. 2, regardless of the total score for the product (this is a limiting rule). "Practically clear" means that the liquid sugar may contain particles of suspended material which do not materially affect the clarity, appearance, or edibility of the product.



(d) (C) classification. Liquid sugar that is fairly clear may be given a score of 42 to 47 points. Liquid sugar that falls into this classification shall not be graded above U. S. Grade C or U. S. No. 3, regardless of the total score for the product (this is a limiting rule). "Fairly clear" means that the clarity, appearance, or edibility of the product is not seriously affected by the presence of finely divided particles in suspension.

(e) (SStd.) classification. Liquid sugar that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 41 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).

§ 52.2717 Defects. (a) General. Defects refers to the degree of cleanliness and to the degree of freedom from extraneous material such as particles of fiber, carbon or earthy material, or any other defects which may be in suspension or deposited as sediment in the container.

(b) (A) classification. Liquid sugar that is free from defects may be given a score of 36 to 40 points. "Free from defects" means that the liquid sugar contains no defects that affect the appearance or edibility of the product.



(c) (B) classification. Liquid sugar that is practically free from defects may be given a score of 32 to 35 points. Liquid sugar that falls into this classification shall not be graded above U. S. Grade B or U. S. No. 2, regardless of the total score for the product (this is a limiting rule). "Practically free from defects" means that the liquid sugar may contain defects which do not materially affect the appearance or edibility of the product.

(d) (C) classification. Liquid sugar that is fairly free from defects may be given a score of 28 to 31 points. Liquid sugar that falls into this classification shall not be graded above U. S. Grade C or U. S. No. 3, regardless of the total score for the product (this is a limiting rule). "Fairly free from defects" means that the liquid sugar may contain defects which do not seriously affect the appearance or edibility of the product.

(e) (SStd.) classification. Liquid sugar that fails to meet the requirements of paragraph (d) of this section may be given a score of 0 to 27 points and shall not be graded above Substandard, regardless of the total score for the product (this is a limiting rule).





DEFINITIONS AND METHODS OF ANALYSES

§ 52.2718 Color of liquid sugar. (a) The color classification of liquid sugar is determined by means of the U.S.D.A. permanent glass color standards for liquid sugar.

(b) Partially crystallized liquid sugar shall be liquefied by heating to approximately  $54.4^{\circ}$  C. ( $130^{\circ}$  F.) and cooled to approximately  $20^{\circ}$  C. ( $68^{\circ}$  F.) before ascertaining the color of the product by means of the U.S.D.A. permanent glass color standards for liquid sugar.

§ 52.2719 Application of U.S.D.A. permanent glass color standards in classifying the color of liquid sugar. (a) Sample containers. The sample containers for use in making the visual color determination, as set forth herein, are cells of optical glass having a length of 100 mm. and a viewing area of  $1-1/8$  x  $1-1/8$  inches.

(b) Comparator. The comparator contains three 100 mm. color tubes, one placed at each side and one placed immediately below the sample cell. The U.S.D.A. permanent glass color standards are mounted opposite the viewing ends of the color tubes.

(c) Visual comparison test. The color of the sample of liquid sugar is compared with the U.S.D.A. permanent glass color standards in the following manner to determine its color classification:



(1) Place the sample of liquid sugar in a clean, dry sample container.

(2) Place the container filled with the sample in position for viewing in the color comparator between two of the color tubes and visually compare the color of the sample with that of each of the glass color standards by looking through them at a diffuse source of natural or artificial daylight. The color is classified in accordance with the color range as given in Table No. I of this section.

(3) If the sample is appreciably cloudy in appearance, a cloudy suspension of approximately the same turbidity as the sample is placed behind the color standard.

Table No. I

Color designation of liquid sugar  
and range for each color

<u>U.S.D.A. Color standards</u>	<u>Color range U.S.D.A. color standards</u>
Water white	Liquid sugar that is equal to or lighter in color than water white color standard.
White	Liquid sugar that shows more color than water white color standard but not more color than white color standard.
Light amber	Liquid sugar that shows more color than white color standard but not more color than light amber color standard.
Amber	Liquid sugar that shows more color than light amber color standard.



§ 52.2720 Total solids. The total solids content of liquid sugar is determined by means of the refractometer at 20° C. (68° F.). The percent total solids is corrected by adding 0.022 for each percent invert sugar in samples containing more than 2.0 percent invert sugar.

§ 52.2721 Invert sugar. Percent invert sugar means percent, by weight, of reducing sugars in liquid sugar calculated on the basis of percent total solids. Invert sugars are determined by the Lane-Eynon volumetric method for reducing sugars.

§ 52.2722 Sucrose. When the sucrose content of liquid sugar is desired in connection with the inspection of an official sample the determination of the percent sucrose shall be made by the chemical method from reducing sugars before and after inversion or by Jackson-Gillis Method IV, or by direct polarization.

§ 52.2723 Methods of analysis. The analyses indicated in this section shall be made in accordance with methods of analysis given in Official Methods of Analysis of the Association of Official Agricultural Chemists or by any other means which give equivalent results.





LOT CERTIFICATION TOLERANCES

§ 52.2724 Tolerances for certification of officially drawn samples. (a) When certifying samples that have been officially drawn and which represent a specific lot of liquid sugar the grade for such lot will be determined by averaging the total scores of the containers comprising the sample, if, (1) all containers comprising the sample meet all applicable standards of quality promulgated under the Federal Food, Drug, and Cosmetic Act and in effect at the time of the aforesaid certification; and (2) with respect to those factors which are scored;

- (i) Not more than one-sixth of the containers fails to meet the grade indicated by the average of such total scores;
- (ii) None of the containers falls more than 4 points below the minimum score for the grade indicated by the average of such total scores;
- (iii) None of the containers falls more than one grade below the grade indicated by the average of such total scores; and
- (iv) The average score of all containers for any factor subject to a limiting rule is within the score range of that factor for the grade indicated by the average of the total scores of the containers comprising the sample.

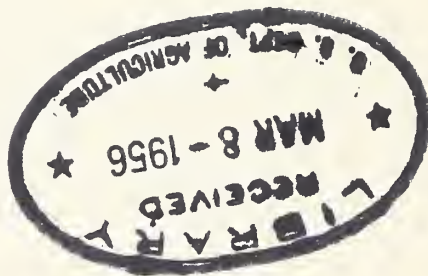


SCORE SHEET

§ 52.2725 Score sheet for liquid sugar.

-----		:	-----
Size and kind of container		:	-----
-----		:	-----
Container mark or identification		:	-----
-----		:	-----
Label		:	-----
-----		:	-----
Type		:	-----
Total solids, percent; Brix		:	-----
Reducing sugars, percent		:	-----
Sucrose, percent		:	-----
Liquid or crystallized		:	-----
-----		:	-----
Factors	:	Score points	:
-----	:	-----	:
Clarity	:	(A) 54-60	:
	60 :	(B) 48-53 1/	:
	:	(C) 42-47 1/	:
	:	(SStd.) 0-41 1/	:
	-----	-----	-----
Defects	:	(A) 36-40	:
	40 :	(B) 32-35 1/	:
	:	(C) 28-31 1/	:
	:	(SStd.) 0-27 1/	:
	-----	-----	-----
Total score	100 :	-----	:
-----	:	-----	:
Grade	-----	:	-----
-----	-----	:	-----
Color	-----	:	-----
-----	-----	:	-----
Flavor	-----	:	-----
-----	-----	:	-----

1/ Indicates limiting rule.





NATIONAL AGRICULTURAL LIBRARY



1022848759